NASA Glenn Research Center
AEROSPACE Frontiers
Volume 6 Issue 1 January 2004

Glenn successfully tests ion engine

Glenn news relase

NASA's Project Prometheus recently reached an important milestone with the first successful test of an engine that could lead to revolutionary propulsion capabilities for space exploration missions throughout the solar system and beyond.

The test involved a High Power Electric Propulsion (HiPEP) ion engine. The event marked the first in a series of performance tests to demonstrate new high-velocity and high-power thrust needed for use in nuclear electric propulsion (NEP) applications.

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Photo by Christian Carpenter

Dr. John Foster (5430), right, and Dr. George Williams (OAI) get ready for the HiPEP project's first beam extraction test. The HiPEP ion thruster is the largest and highest powered microwave-driven ion thruster ever tested.

Glenn showcased for fostering economic development

Headquarters release

Glenn is among seven prominent Federal laboratories highlighted in the Department of Commerce report, "Partners on a Mission: Federal Laboratory Practices Contributing to Economic Development." Selected lab partnerships were chosen for their outstanding and innovative activities in economic development and their ability to serve as an example for other labs.

The report, published by Commerce's Office of Technology Policy (OTP), also includes case studies of two intermediary programs that work with geographically distant Federal labs to bring resources to regions without a major laboratory.

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Fails named Associate Director

Fails

Robert Fails, who served as Glenn's chief financial officer (CFO) since 1995, has been assigned to the position of Associate Director (0100). In his new position, Fails is responsible for supporting the Center Director in the overall management and direction of the Center.

"It's a real honor for me to have been asked to work with our Center Director Julian Earls and Deputy

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Inside

One NASA panel visits

BY S. JENISE VERIS

How does the One NASA initiative differ from past initiatives? That's the question that One NASA Implementation Team Leader Johnny Stephenson and representatives of Agency leadership addressed during Glenn's One NASA All Hands Meeting on December 12.

Stephenson, Deputy Administrator Fred Gregory, Associate Administrator of Space Science Dr. Ed Weiler, and Goddard Space Flight Center Director Al Diaz shared their perspective on the Agency's vision for One NASA, and then joined Glenn Center Director Dr. Julian Earls as panelists for the Q&A session that immediately followed.

According to Stephenson, One NASA is an effort to reorganize the Agency's structure at the grassroots level and move toward a work culture characterized by (1) teamwork and open communications, to promote the optimal application of all our skills, regardless of where they are; (2) availability of the right tools, to do our best work and push the envelope to do even better; (3) standardization of funding across the Agency, to enable good decisions based on sound financial practices; and (4) accountability, to build credibility with the folks we serve and greater opportunity for increased funding in the future. The success of One NASA, Stephenson contends, will ultimately be determined by the inherent strength of the Agency long after the current workforce is gone and a new workforce has taken its place.

The panel of Agency leaders took on a series of questions following the One NASA All Hands Meeting.

C-2003-2098 Photo by Quentin Schwinn

Glenn Deputy Director Rich Christiansen, who relocated from Dryden to Glenn in November, explained why mobility across NASA supports the Agency. "Mobility helps you build a continuous set of skills that improve with every step of the way," he said. "And in terms of personal growth, it helps you create a database of the brilliant people you have worked with and can count on to respond with a phone call."

Diaz gave an overview of the five Goddard campuses and prospects for the future collaboration encouraged by One NASA.

"Although we are involved in a full range of activities with each of the centers, we are anxious to develop our educational programs and outreach. Since Glenn is recognized as a leader in that activity, we are looking forward to more collaboration in that effort to inspire a new generation of explorers."

Weiler gave a historical presentation of NASA's exploration of the galaxy and explained how the goals of One NASA would help enable us to answer the age-old question: Are we alone?

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Glenn chosen as example for other labs

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"NASA Glenn's inclusion in this report is a tribute to the Center's dedication to pursuing innovative approaches for transferring its technology and technical know-how to enhance the level of local, regional, and national economic development," said Glenn Director Dr. Julian Earls. "We are honored indeed to be included among these highly accomplished Federal laboratories."

Glenn was recognized for fostering economic development through a comprehensive program of business incubation, technology and business assistance, education outreach, and workforce development. Highlighted Glenn economic development-related programs and initiatives include Science, Engineering, Mathematics, and Aerospace Academy (SEMAA); Garrett Morgan Commercialization Initiative Glennan Microsystems Initiative; Pre-Apprentice Machining Program; SBIR/STTR Assistance; Commercial Technology Fund; Lewis Incubator for Technology (LIFT); and Ohio Aerospace Institute.

The other Federal labs highlighted in the report include Air Force Research Laboratory, OH; Communications Electronic Command Research, Development, and Engineering Center, NJ; Los Alamos National Laboratory, NM; Naval Air Warfare Center Aircraft Division and the Naval Air Systems Command, MD; Pacific Northwest National Laboratory, WA; and Sandia National Laboratories, NM.

"Federal laboratories are playing an increasingly important role in promoting regional growth," explained Bruce Mehlman, Commerce assistant secretary for Technology Policy. "This report provides policymakers, economic development organizations, community groups, and Federal labs and agencies with examples of effective partnerships."

The report is a product of OTP's contract with Innovation Associates, Inc., which administered a questionnaire, conducted onsite research, and produced case studies on several exemplary Federal lab programs supporting technology-led economic development. A copy of the report can be found at http://www.technology.gov/reports. ◆

One NASA initiative

Continued from page 2

In his concluding remarks Deputy Administrator Gregory, affirmed Weiler's vision but suggested NASA should already be seeking to define its role above and beyond that. "How we combine our skills, strengths, capabilities, and passions to make it happen—that's what One NASA is all about."

Fails to serve in new role

Continued from page 1

Director Rich Christiansen, and serve this Center in this new capacity," Fails said.

Fails joined the Center in 1978 as a program analyst where he had a significant role in decentralizing the Center's budget management process. He served in a number of managerial positions, including his selection as chief of the Center's Central Budget Office in 1989 and deputy comptroller in 1994. Fails has received several awards during his career, including NASA's Exceptional Service Medal in 1994 for his innovative approach to managing the Center's budget formation process, and a Presidential Rank Award of Meritorious Executive in 2000.

Dan Walker is serving as the deputy CFO, working closely with Fails during this transition period. ◆

Project Prometheus reaches important milestone

Continued from page 1

"The initial test went extremely well," said Dr. John Foster, the primary investigator of the HiPEP ion engine, On-Board Propulsion Branch. "The test involved the largest microwave ion thruster ever built. The use of microwaves for ionization would enable very long-life thrusters for probing the universe," he said.

The test was conducted in a vacuum chamber at Glenn. The HiPEP ion engine was operated at power levels up to 12 kilowatts and over, an equivalent range of exhaust velocities from 60,000 to 80,000 meters per second. The thruster is being designed to provide 7-to-10-year lifetimes at high fuel efficiencies of more than 6000-seconds specific impulse; a measure of how much thrust is generated per kilogram of fuel. This is a contrast to a standard chemical rocket, which has a specific impulse on the order of 300 to 400 seconds.

The HiPEP thruster operates by ionizing xenon gas with microwaves. At the rear of the engine is a pair of rectangular metal grids that are charged with 6000 volts of electric potential. The force of this electric field exerts a strong electrostatic pull on the xenon ions, accelerating them and producing the thrust that propels the spacecraft. The rectangular shape, a departure from the cylindrical ion thrusters used before, was designed to allow for an increase in engine power and performance by means of stretching the engine. The use of microwaves should provide much longer life and ion-production capability compared to current state-of-the-art technologies.

This new class of NEP thrusters will offer substantial performance advantages over the ion engine flown on *Deep Space 1* in 1999. Overall improvements include up to a factor of 10 or more in power; a factor of 2 to 3 in fuel efficiency; a factor of 4 to 5 in grid voltage; a factor of 5 to 8 in thruster lifetime; and a 30 percent improvement in overall thruster efficiency. Glenn engineers will continue testing and development of this particular thruster model, culminating in performance tests at full power levels of 25 kilowatts.

"This test represents a huge leap in demonstrating the potential for advanced ion technologies, which could propel flagship space exploration missions throughout the solar system and beyond," said Alan Newhouse, director, Project Prometheus. "We commend the work of Glenn and the other NASA centers supporting this ambitious program."

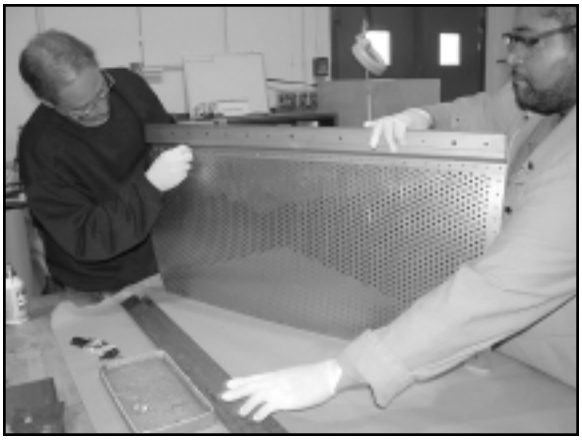
HiPEP is one of several candidate propulsion technologies under study by Project Prometheus for possible use on the first proposed flight mission, the Jupiter Icy Moons Orbiter (JIMO). Powered by a small nuclear reactor, electric thrusters would propel the JIMO spacecraft as it conducts close-range observations of Jupiter's three icy moons, Ganymede, Callisto, and Europa. The three moons could contain water, and where there is water, there is the possibility of life.

Development of the HiPEP ion engine is being carried out by a team of engineers from Glenn; Aerojet, Redmond, WA.; Boeing Electron Dynamic Devices, Torrance, CA; OAI, Cleveland, OH; University of Michigan, Ann Arbor, MI; Colorado State University, Fort Collins, CO; and the University of Wisconsin, Madison, WI.

For more information about Project Prometheus on the Internet, visit http://spacescience.nasa.gov/missions/prometheus.htm. ◆

Left to right, James Kelly, 7270/AKAC, and Tommy Brown, AKAC, assemble the ion optics for the HiPEP engine.

Photo by Christian Carpenter



Lifesavers

The Glenn Safety Office, in conjunction with Occupational Medicine Services, recently acquired nine new automated external defibrillators (AED) for use in cases of perceived heart attacks. A total of 13 units is now available onsite. The portable units record vital signs and walk operators through the process of stabilizing victims until emergency personnel arrive. Data is electronically recorded in the unit and sent to the hospital. Five of the new units have been placed in patrol vehicles to be used by trained security personnel, and the other 11 units are located throughout the Center. Plum Brook Station currently has five defibrillators. The American Red Cross will be providing training in the coming months for employees interested in learning to operate the defibrillators. Pictured, center, is Manuel Dominguez, manager of Glenn's Safety Office, providing an AED to security officers Bill Rivett, left, and Thomas Kish, to be placed in a patrol vehicle.

Photo by Doreen B. Zudell

C-2003-2096

Photo by Marvin Smith

Celebrating TGIR successes

This year, six Glenn-led teams and their partners were recognized with Turning Goals Into Reality (TGIR) Awards for outstanding contributions toward achieving NASA's Aerospace Technology Enterprise goals, which was the best outcome for any center in the Agency. To honor the efforts of all team members from civil servants to contractors and grantees, Glenn recently hosted a TGIR appreciation breakfast. Deputy Center Director Rich Christiansen, who helped pioneer the TGIR concept, provided opening remarks. Dr. Arun Sehra, director of the Aeronautics Directorate, and Dr. Jih-Fen Lei, deputy director of the Research and Technology Directorate, shared their pride in and support of the Glenn teams as well. (For detailed information on the awards, refer to the July 2003 *AeroSpace Frontiers.)* Pictured, left, is Christiansen talking with TGIR winners John Jones (7700/ZINT), center, and Cameron Cunningham (7725), members of the Fan Noise Reduction Team.

Knowledge sharing

Ray Morgan, who is president of Morgan Aircraft Company, Simi Valley, CA, and a pioneer in the development of next-generation aircraft since the 1970s, recently spoke with some of Glenn's current and emerging project managers and leaders. The event was a Knowledge Sharing Workshop sponsored by NASA's Academy of Program and Project Leadership and hosted by Glenn's Systems Management Office. During the workshops, practitioners learn from the stories of seasoned managers, and reflect on their own experiences to develop as mature and effective project leaders. The intent is to develop a broad-based community of emerging program and project leaders to interact on a regular basis and begin a process of knowledge sharing. For further information on Glenn's Knowledge Sharing Workshops, contact Harvey Schabes, 216–433–5309. Pictured is, left, Morgan, with Schabes.

Photo by Doreen B. Zudell

Powering Flight Powering Dreams . . .

Two years ago, former Center Director Donald Campbell advocated Glenn's participation in the centennial of the Wright Brothers' first flight. This would be the perfect opportunity to show the public just how far NASA has come in 100 years.

Dr. Julian Earls, serving in the role of deputy director of operations at the time, contributed to this goal by challenging a core Glenn team to offer their best. Former Liaison Officer Karen Hickman led the outreach and marketing campaign. David DeFelice, Community and Media Relations Office, led the design efforts in the *Powering Flight, Powering Dreams* exhibit, NASA's ambassador to the public during the centennial year. Carol Galica, Educational Programs Office, helped to produce the *Re-Living the Wright Way* Web site and signature NASA centennial publications. And a Glenn team of 300 staffers, many contributors on campus, supportive managers, and countless other helpers tightened the nuts and anchored the bolts—and the projects rolled into action.

"We had 10 events around the country to show our stuff...and that we did," said Glenn's Centennial of Flight Project manager Susan Hennie. "This tribute is thanks to every person who helped. The work was exhausting, but rewarding. We laughed and joked with astronauts. Wright nieces, nephews, and cousins mingled at Dayton; we saw nephew Melvin Wright shake John Glenn's hand. John Glenn made the acquaintance of John Travolta! We watched Neil Armstrong discuss the strategy of space exploration."

Hennie affirmed, "The public loves NASA. To the public, we really are the organization that works for the good of all humankind. We cherished the privilege of telling NASA's story. And we discovered that Americans are proud of us."

Air Power 2003


Festival of Flight 2003


Inventing Flight

Centennial Snapshots


Dayton 2003 Air Show


EAA AirVenture OshKosh


Centennial of Powered Flight Gala

Air Power 2003 . . . May 10–11, Wright-Patterson Air Force Base, Dayton, OH
Every aircraft in the current Air Force inventory was displayed on the Wright-Patterson Airfield. NASA had a hangar exhibit on the history of NASA–WPAFB collaboration. Event highlights included Air Force demonstrations, a historic flyover, and visits to Huffman Prairie Flying Field, where the Wrights perfected their Flyer.

Festival of Flight 2003 . . . May 16–26, Fayetteville, NC
The Festival of Flight saluted the Wrights with an arts festival, a 2-day military air show at Pope Air Force Base, a general aviation air show, a 7-day exposition with displays and exhibits, and a spectacular Memorial Day celebration. NASA's Powering Flight, Powering Dreams exhibit debuted, wowing visitors.

Inventing Flight: Dayton 2003 . . . July 3–20, Dayton OH
The Wrights' hometown festival featured "Celebration Central," an elaborate miniature city of attractions, exhibits, entertainment venues, and carnival rides. Activities also extended to satellite locations and citywide events, conventions, and ongoing exhibits.

Dayton 2003 Air Show and Expo 2003 . . . July 17–20, Dayton, OH
The 2003 Air Show treated more than 160,000 guests to flying exhibitions, display aircraft, and a showcase of progress in the first century of flight by era, category, and type. Demonstrations by the Thunderbirds, Blue Angels, and many other flyers thrilled the crowds.

Experimental Aircraft Association AirVenture . . . July 29–August 4, Oshkosh, WI
EAA AirVenture Oshkosh attracted record-breaking crowds of over 700,000 people and about 12,000 airplanes. Thousands of aircraft participate each year in this flight fantasia, including homebuilts, antiques, classics, warbirds, ultralights, and rotorcraft.

Centennial of Powered Flight Gala . . . August 29, Cleveland, OH
Mayor Jane Campbell and Senator John Glenn cohosted this black-tie gala at the Renaissance Cleveland Hotel to kick off the Cleveland National Air Show. Guests were treated to a presentation on aviation in Cleveland and a rare first-hand account of the Apollo 13 adventure by Commander Jim Lovell and former NASA Mission Control Flight Director Gene Kranz.

Design by Jim Lucic

Cleveland National Air Show . . . August 30–September 1, Cleveland, OH
One of Northern Ohio's largest regional events celebrated not only Cleveland's role as "Host to the Golden Age of Aviation" during the National Air Races from 1929 to 1949, but also Ohio's role as the "Birthplace of Aviation": more astronauts (21 at last count) have come from Ohio than any other state.

International Symposium on Air Breathing Engines . . . August 31–September 5, Cleveland, OH
The International Symposium on Air Breathing Engines (ISABE) is only held in the United States every 6 years. The XVI ISABE, held at the Renaissance Cleveland Hotel, offered an outstanding opportunity for technical interchange and professional networking.

L.A. County Fair . . . September 12–28, Pomona, CA
Exhibits like High Flying Fun! and the Flower and Garden Pavilion drew thousands of vistors for 17 spectacular days. Centennial events and the traditional entertainment of the L.A. County Fair were wrapped up into one package with more to see and do than any other venue.

Realizing the Dream of Flight: A Symposium Honoring the Centennial of the Wright Brothers' First Flight
November 5, Cleveland, OH
During this 1-day Centennial of Flight conference at the Great Lakes Science Center, prominent national authors and aerospace historians presented biographical profiles of pioneers from the history of aeronautics and space exploration.


Cleveland National Air Show


XVI ISABE


L.A. County Fair


Realizing the Dream of Flight

Photos courtesy of NASA Dryden, Glenn, and Langley

First Flight Centennial Celebration
December 12 to 17, 2003

From December 12 to 17, 2003, visitors to the Wright Brothers National Memorial in Kill Devil Hills, just south of Kitty Hawk, NC, honored Orville and Wilbur Wright's historic flight. The event served as the climax of a year's worth of tributes, exhibits, and events across the country.

If all had gone as planned on December 17, 2003, a replica of the Wright 1903 Flyer, painstakingly built over 4 years by dedicated craftsmen, would have flown a few feet and created a great moment of historic déjà vu.

Instead, the fragile plane was never able to adequately lift off due to rain and intermittent winds. Yet those who attended the celebration—including many employees from across NASA centers who provided presentations and staffed exhibits—were not disheartened. A variety of programs, events, exhibits, and shows highlighting aviation history made for an educational and entertaining experience for more than 30,000 visitors.

Special guests who actually lived the history of 20th-century flight—retired Brigadier General Chuck Yeager, the first pilot to break the sound barrier; Mercury astronaut John Glenn, the first American to orbit the Earth; and Apollo 11 astronaut Neil Armstrong, the first human to step on the Moon—added to the nostalgia. Other notable guests such as President George W. Bush, NASA Administrator Sean O'Keefe, and NASA Deputy Administrator Frederick Gregory, stopped by to share their support. Actor and avid pilot John Travolta served as master of ceremonies, while thousands of aviation enthusiasts, many flying their own planes, joined in the celebration.

The Wright Brothers would have been proud of this commemorative celebration and the noble attempt to reenact one of the defining accomplishments of the 20th century.

Kitty Hawk photos courtesy of Katherine Barnstorff, NASA Langley

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Personal Impact Dual Career Ladder

Promotions reward technical excellence

Glenn employees were recently selected for promotion to the GS–14 and GS–15 levels through a unique program that enables outstanding technical contributions to attain the same prestige and compensation as individuals on a managerial career track.

The Personal Impact Dual Career Ladder Program is based on the concept that while supervision is one ladder to high-level responsiblity in scientific work there is another ladder—the ladder of personal creativity and scientific contribution. This makes it possible for the contributions of a highly creative, nonsupervisory scientist or engineer to merit the same grade as an individual at the supervisory level.

Promotions to the GS–14 level: Dr. Lynne Anderson, Aeronautics Directorate; Dr. Milo Dahl, Dr. Paula Dempsey, Dr. Barbara Kenny, Dr. Robert Okojie, Thomas Ratvasky, Marc Siebert, and Dr. Neil Van Dresar, Research and Technology Directorate; Dr. Rafat Ansari and Brian Motil, Space Directorate; Richard Oeftering, Engineering and Technical Services Directorate.

Promotions to the GS–15 level: Dr. David Fleming, Dr. Gary Hunter, Sharon Miller, Dr. Steven Schneider, and Ignacy Telesman, Research and Technology Directorate. ◆


Dr. Anderson


Dr. Ansari


Dr. Dahl


Dr. Dempsey


Dr. Fleming


Dr. Hunter


Dr. Kenny


Motil


Dr. Okojie


Ratvasky


Dr. Schneider


Dr. VanDresar

Check it out!

Glenn introduces new online process for grants

To streamline the grant process for the technical community, the new Grantsonline system has been created. Grantsonline is a Web-based application with two modules: an online technical evaluation module and a grant module that manages logging and tracking of Glenn proposals. The online technical evaluation module allows the Glenn community to (a) reject a proposal; (b) accept a proposal, create a technical evaluation online, and submit the evaluation to the Grant Office electronically; or (c) recommend additional years for a multiple-year grant or cooperative agreement. The Grantsonline system data automatically feeds into the Grant Office's Grants Database Program, a document generation system. Use of the system will be mandatory Centerwide in February 2004.

Grantsonline will reduce the grant processing time in technical and procurement organizations by validating input and eliminating duplicate data entry. It will also save the Government money by reducing the labor to log and track a proposal or process an evaluation or award. Grantsonline will also be able to process an award to nonprofit organizations.

All personnel involved in the grant award process should go to the test (http://grantsonline-tt.grc.nasa.gov) and production (http://grantsonline.grc.nasa.gov) Web sites and request a password for Grantsonline as soon as possible. ◆

In Memory

Douglas Bewley, 46, passed away suddenly November 30. Bewley worked for 10 years at Glenn as a civil servant providing engineering support to the Rocket Engine Test Facility (RETF) in the South 40, and had been working with QSS Group since 2001 on the relocation of the South 40 facilities as part of the Airport Expansion Project. He was recently ordained as a deacon at the Assumption of Mary Catholic Church in Brook Park. Bewley leaves behind his wife, Kathy, and 8 children, as well as many friends here at Glenn. A fund has been set up for the family under the "Douglas P. Bewley Family Fund." Donations can be made at any Key Bank branch office.

Bewley

Joseph Kloscak, 85, recently died**.** He retired in 1975 after 30 years of NASA service. Kloscak served as a warehouse leader. He is survived by his wife, Gladys Kloscak, who also worked at the Center until 1974.

Eugene McIrvin, 67, recently died. McIrvin retired in 1990 with 33 1/2 years of NASA service. He served as an electronics technician.

Retirements

Francis Montegani, Office of University Programs, retired on June 30, 2003, with 34 years of NASA service.

Robert Zakrajsek, Communications Technology Division, retired on October 30, 2003, with 40 years of NASA service.

Laszlo Zala, Facilities and Test Engineering Division, retired on November 30, 2003, with 17 years of NASA service.

Zakrajsek

Zala

Glenn shines in Space Act awards

At the close of the fiscal year, NASA Headquarters announced that Glenn was in the lead for all centers (not including the Jet Propulsion Lab) for Space Act awards. This tally includes awards paid for patent applications, software releases, actions reviewed by the Inventions and Contributions Board, and for published Tech Brief articles. This success is due to the innovative work performed by Glenn researchers and the diligent efforts the Center's Technology Transfer and Partnership Office staff to promote it. Innovators interested in submitting a nomination for a Space Act should contact Laurie Stauber, 216–433–2820.

Exchange Corner

● From Monday through Friday, January 12 to 16, the Exchange Store will hold an after-the-holidays 20-percent-off sale. A happy and healthy new year to you from the Exchange staff!

● Watch for details on the Chinese New Year lunch special on Thursday, January 22.

People

Award

The Cleveland Section of the American Chemical Society presented **Dr. Mary Zeller**, chief, Instrumentation and Controls Division, with the Salute to Excellence award for her outreach efforts to make science fun as well as educational. Zeller was lauded for her leadership in Glenn's support of National Chemistry Week (NCW) programs, which included sponsoring the Cleveland Section NCW Chemistry and Poster Contests; presenting NCW hands-on demonstration programs in the Visitor Center and in numerous local libraries; and printing of the NCW demonstration scripts, which has allowed NCW volunteers from around the Cleveland area to reach thousands of children, their parents, and their teachers with exciting and informative messages about chemistry.

Dr. Zeller

AeroSpace Frontiers is an official publication of Glenn Research Center, National Aeronautics and Space Administration. It is published the first Friday of each month by the Community and Media Relations Office in the interest of the Glenn workforce, retirees, government officials, business leaders, and the general public. Its circulation is approximately 6700.

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DEADLINES: News items and brief announcements for publication in the February issue must be received by noon, January 16. The deadline for the March issue is noon, February 13. Submit contributions to the editor via e-mail, doreen.zudell@grc.nasa.gov, fax 216–433–8143, phone 216–433–5317 or 216–433–2888, or MS 3–11. Ideas for news stories are welcome but will be published as space allows. View us online at http://AeroSpaceFrontiers.grc.nasa.gov.

WINNER 2002 APEX AWARDS FOR PUBLICATION EXCELLENCE

News Notes

LESA MEETING: LESA/IFPTE, Local 28, will hold its next monthly membership meeting on Wednesday, January 14, at noon in the Employee Center, room 101.

AFGE MEETING: AFGE Local 2182 will hold its next monthly membership meeting on Wednesday, February 4, 2004, at 5 p.m. at Denny's Restaurant, 25912 Lorain Road, North Olmsted. All members are encouraged to attend.

ESSENTIAL CONNECTION ANNIVERSARY: The Essential Connection Quality Circle's 19th year reunion luncheon will take place on February 20, 2004. If you were a member of this quality circle during the 10 years it was active, you are invited to the reunion luncheon. Contact Mary Tharp, 216–433–3501, Sonia Schriver 216–433–2811, Debbie Cotleur 216–433–3904, Sandra Foust 216–977–7477, or Marcia Bellamy, 216–977–7452 to learn more about our reunion luncheon. If you have any memorabilia that you can share with us, please contact Cotleur or Shriver for the memory wall and scrapbook.

WOMEN RETIREE LUNCHEON: The next luncheon for Glenn (Lewis) female retirees is Thursday, February 12, noon, at Donauschwaben's German American Cultural Center, 7370 Columbia Road, Olmsted Township. For further information, contact Ann Lester, 440–777–3073.

DISTINGUISHED PUBLICATION: Nominations for the 2003 Glenn Distinguished Publication Award, instituted to encourage and reward outstanding research and technology contributions by Glenn staff members, must be submitted to division chiefs by 4:30 p.m. on Monday, February 2. The paper must be a publication or presentation dated between July 1, 2002, and June 30, 2003. Division chiefs must submit their final selections to their directorate offices by 4:30 p.m. on Friday, March 19. Each directorate office will send one package to the chief scientist's office by 4:30 p.m. on Friday, March 26. Employees will find a *Today@Glenn* bulletin outlining the selection process, which will also be sent via email to each directorate. For further information, contact Anthony.J. Strazisar@nasa.gov.

Behind the Badge

a closer look at our colleagues

Patricia Foltz

Photo by Christine Bodi

Job assignment: I work for RS Information Systems (PACE) supporting the video-conferencing room in the . I schedule, operate, and provide communication services to our users for conferences. The facility is generally known to Glenn employees as the "ViTS Room" and is located one floor beneath the Center Director's office. When asked about my job, I like to joke with others and tell them I work directly below the Center Director.

Time at NASA: I've had the privilege of working at NASA for 3 years.

Describe your family: I have been married to the world's greatest husband for 23 years. We laugh more than any couple I know and our relationship continues to grow deeper every year. We were not blessed with children but believe that God has another plan for our lives to use the unique gifts and talents He has given us. My dad, mom, and mother-in-law are in their 80s and learning the many challenges of growing old. I grew up with five brothers and no sisters, so I learned to throw a mean football. I like to spend time watching my nieces and nephews develop their imaginations and creative skills.

Favorite quote: I had a friend named Bob Steele who use to say, "Don't let the negatives defeat you. Always look for a way to turn a negative into a positive."

Hobbies/interests outside of NASA: Some of my hobbies include running, reading, cooking, listening to music, and skiing, but my favorite hobby is music. I began playing the flute when I was 9 and the viola when I was 13. I later earned a master's degree in music and performed professionally with two local orchestras, while teaching flute, chamber orchestra, and woodwind pedagogy at a local college. For the past 10 years I played flute in my church orchestra. Recently, I picked up the viola again to help support the string section. The greatest joy I have in playing my instruments is giving back to the Lord those gifts and talents He first gave me.

Food temptations: I have a huge weakness for anything rich, sweet, and full of chocolate, including a hot fudge sundae at Malley's.

Philosophy to live by: Philippians 2: 3-4: "Do nothing out of selfish ambition or vain conceit, but in humility consider others better than yourselves. Each of you should not only look to your own interests but also to the interest of others."

Stress buster: I like to run three miles in full stride on a cool, clear, sunny day, or practice my flute or viola for a good 90 minutes. Cooking a healthy dish relaxes me, providing the meal is prepared within 1 hour. A brisk walk around the with a friend is highly recommended!

If you or someone you know is interested in being featured in this column, please contact us at 216–433–5317 or Doreen.Zudell@grc.nasa.gov.

Glenn aids MER mission prospects of success

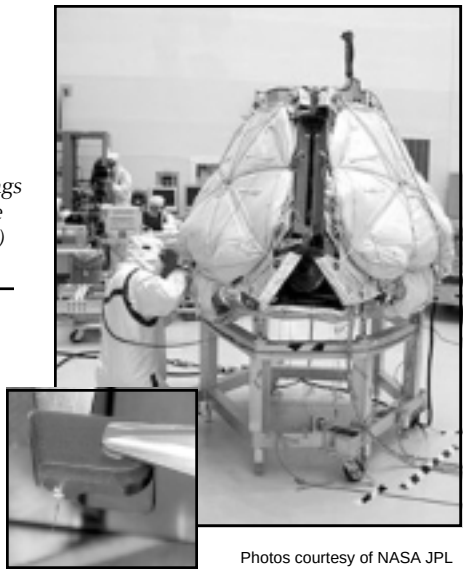
BY S. JENISE VERIS

With excitement comparable to the Gold Rush era of yesteryear, NASA and its international partners eagerly await news of a safe landing of the *Spirit* and *Opportunity* rovers; next, the two robots start panhandling for "liquid gold" on Mars. Everything "humanly" possible has been done to minimize the risk and enhance the chances of success for the Mars Exploration Rover (MER) mission.

Nearly 3 years were devoted to determining the ideal sites for landing, while analysis and testing of an air bag landing system was conducted at Glenn's Space Power Facility (SPF), at Plum Brook Station in Sandusky.

"Just getting to Mars is a risk, but landing is more so," said Dr. Ed Weiler, NASA's associate administrator for Space Science. "Landing the rovers safely requires elaborately choreographed use of heat shields, parachutes, rockets, and air bags. A strong gust of wind, or a single sharp rock, could destroy either or both rovers."

According to SPF manager Jerry Carek, more than 50 drop tests of different airbag design configurations were conducted between December 2001 and December 2002. In August 2003, testing was conducted continuously for 2 weeks.



Pictured is a rover folded up with air bags designed to cushion landing. Discharge points–15,000th of an inch–(see insert) are mounted to limit static impact.

Photos courtesy of NASA JPL

Spirit, the first of the two golf-cart-sized rovers (each fitted with identical science instruments) is scheduled to land this month near the center of Gusev Crater, which once held a lake. Next month, *Opportunity* should reach the Meridiani Planum, a broad area of mineral deposits located halfway around Mars from Gusev.

In the cold, dry environment of Mars, weather tends to be smoggy because dust hangs in the atmosphere. Glenn science team members on the mission aim to learn how that atmosphere might impact rover operations.

Researchers from the Glenn Photovoltaic and Space Effects Branch (PSEB) have equipped each rover with four wire discharge points—two in front and two in back. The points will act as miniature lightning rods to control static charging within "safe" limits as the rovers travel across the dusty surface of Mars.

"Monitoring the amount and characteristics of electrical charge, will enable correlation between charge sign and dust grain size to be applied to a meteorological analogy of Martian atmospheric dust and terrestrial atmospheric water," explained Joe Kolecki, PSEB.

How dusty a solar array can get before it begins to lose power and how much energy solar cells will be able to generate under Mars sunlight are the two questions Dr. Geoffrey Landis, PSEB, seeks to answer.

"Determining the efficiency of solar cells is critical to powering the computers that control the rovers and scientific instruments as well to sending and retrieving data from Earth," Landis said. "This information will prove most important to not only this mission but also in planning the duration of future missions." ◆

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